

Methodologies in support of the Energy Performance of Buildings Directive: The UK approach to implementation for buildings other than dwellings

AIM OF THIS PAPER

- 1 This paper has been placed on the ODPM web site to describe the strategy that ODPM, DEFRA, the Scottish Executive and the DfP Northern Ireland are pursuing in developing the methodologies required the Energy Performance of Buildings Directive. It is addressed to all those who have an interest in these proceedings, with the aims of:-
 - a) providing early notice of the approaches being considered to develop what will eventually become obligatory procedures,
 - b) stimulating debate on whether the approaches can be improved,
 - c) capturing issues or circumstances that have been missed.
- 2 Article 3 of the Directive requires Member States (MSs) to have national calculation methodologies in place by 04 January 2006 delivering the building performance standards and certification procedures required in the Directive's Articles 4 to 7. The Standard Assessment Procedure for the Energy Rating of Dwellings (SAP) is being revised as the prospective Article 3 national calculation methodology for dwellings; the rest of this paper concentrates on the calculation methodology and supporting procedures needed for other building types.
- 3 The detailed explanations of the strategy given below refer to Part L of the Building Regulations for England and Wales. However, whilst different legal and administrative arrangements will apply in Scotland and Northern Ireland, the strategy is to deliver one national calculation methodology that can be implemented in the three regions simultaneously to meet the Directive deadline.
- 4 The paper has been developed as the output from discussions with the organisations listed at Annex A. A meeting of specialists was convened by the ODPM as part of the Building Regulations Part L review. This group met on 20 August 2003 with the aim of bringing existing development activities to a focus, to establish what new activities are required, and to define the development programme(s) in order to deliver a coherent system that will enable compliance with the Directive in all building ownership circumstances. **Development work is now proceeding in line with the strategy agreed and set out below with the aim of publishing proposals in the Summer 2004, as part of the formal consultation on proposed amendment of Part L of the Building Regulations.**
- 5 It has been agreed that the group will continue to meet to assist ODPM in the development of the proposals and its next meeting has been set for 20 November 2003. If you wish to raise an issue or comment on the development work ahead of the formal consultations please make contact with the group's secretariat by email ¹.

Methodological Framework

- 6 The intention behind this proposed methodology is to have a seamless transition through design, commissioning, building regulations control, early operation, building certification, energy targeting operation, maintenance and refurbishment. The first essential point is that methodologies are required in two principal areas –
 - a) Demonstrating that new build or refurbishment work complies with the energy performance standards to be set out in Part L (Articles 4-6)
 - b) Developing the various ratings required by the certification system (Article 7).

The framework is presented in these two elements, but there is considerable synergy between the two aspects.

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DEMONSTRATING COMPLIANCE WITH PART L (ARTICLES 4-6)***The calculation tool***

- 7 The heart of the methodology is the Calculation Tool. This has two main purposes –
- To assist in setting the performance standards in Articles 4 to 6 of the Directive that are likely to be transposed into law in England and Wales or will provide the basis of the guidance on what is reasonable provision for energy efficiency.
 - To calculate the energy performance of the building project (new or refurbished) that will then be compared with the legal performance standard.

For convenience, these two activities are discussed separately, but it is clear that the same tool has to be used for establishing the standard and testing compliance.

- 8 It was agreed that there would be an advantage in having a single tool as the primary calculation engine for Building Regulations purposes. Key criteria for selecting an appropriate calculation methodology include –
- It must be deliverable within the timescale required by the Directive.
 - It must address the parameters set out in the Annex to the Directive
 - It must be in the public domain
 - It must be capable of handling all types and sizes of non-domestic building
 - It must exhibit good repeatability in establishing legal compliance - different users assessing the same design must get essentially the same answer.
 - It must be technically robust, the results must be credible, with the tool being able to discriminate effectively between different design options and be easily extendible to accommodate new technical options such as renewables etc.
 - It must be adaptable so that the prospective European Standards for calculation methodologies can be taken into account once they are published, and improvements can be made as experience dictates.
 - It should be easy to check; for compliance checking purposes, the input data and the calculation process should be auditable.
 - It should attach modest cost in terms of time needed to generate the input and in terms of hardware and software resources needed to run the tool.

It was agreed that there are two main options to satisfying these criteria –

Option 1 - a simplified method

- 9 In this approach, we would adopt/refine a simplified calculation tool, similar to SAP. The method in the Dutch standard NEN2917 is a simplified method based on a monthly heat balance approach, and is the only known method that includes estimates for cooling energy. This would provide a good starting point, but some development work would be required to resolve some known technical problems. It would also be necessary to configure the method for UK climate and design practice.
- 10 Such an approach would probably score well against criteria b), c), e), h) and i) above, but might be less appropriate in terms of criteria f) and d) and perhaps g). However, any problems arising in respect of the first two of these three latter criteria could be overcome by continuing to accept the comparison philosophy currently recognised in the Carbon Emissions Calculation Method in ADL2(2002). This would require the designer to use the simplified method to develop the specification of a reference building of the same size and shape as his actual design and that met the legal standard. This reference building would then be modelled using whatever quality assured calculation tool the designer deemed appropriate for his purposes. This would define the target that the actual design would need to meet or better.

Option 2 - a detailed simulation method

- 11 In this second approach, we would adopt a single detailed simulation model. Because of the desire for a public domain tool, this probably limits the choice to Energy+, a tool created from merging the

- best elements of two US public domain tools, DOE-2 and BLAST. This has a wide user base, and has a very secure and effective support activity.
- 12 This approach would score very well against criteria d) and f), although some work with the UK air conditioning industry might be needed to generate the full set of HVAC systems commonly used in the UK (radiant cooling perhaps being the main example).
 - 13 The main concerns would be in respect of criteria e), h) and i). The problem with criteria e) and h) is that the flexibility of a simulation tool allows the same building design to be represented to the simulation at varying levels of detail. Different levels of detail would generate different predictions of energy demand, which creates a problem when comparing the prediction against a fixed target value.
 - 14 Another concern would be that adopting Energy+ might be seen to be endorsing a particular simulation program, which could then undermine the market for other proprietary programs developed for designers' use. These problems could be overcome by making the Building Regulations tool not the full Energy+, but a specifically tailored version of it, which provides a controlled interface, which dictates the way buildings are represented to the simulation. This Building Regulations variant could be applied separately, but the proprietary software houses might wish to incorporate it as a module within their overall modelling package.

Making the choice

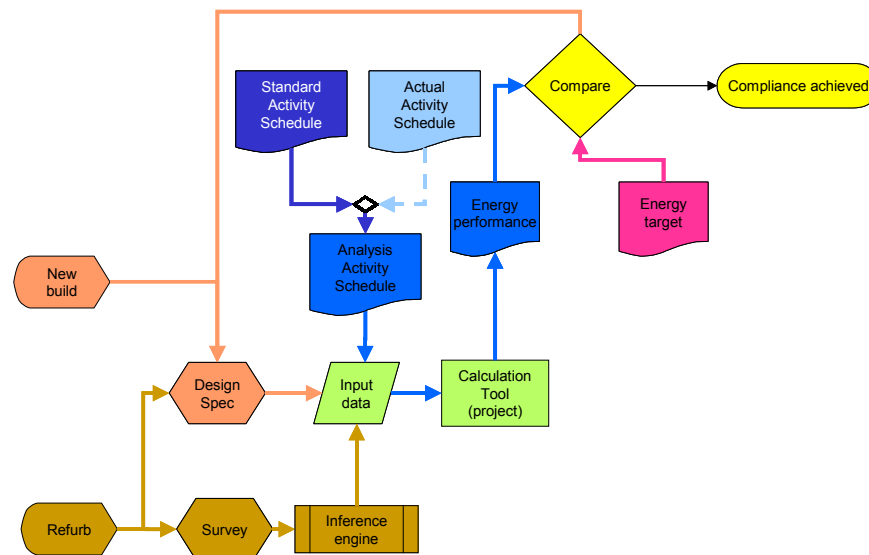
- 15 The relative merits of these different types of tool will be explored as part of the proposed EC project BEST-Cert, and we are therefore supporting this project so that it can go ahead. BEST-Cert will look at both the technical strengths and weaknesses of the different approaches, and will also investigate user interface issues, so that the tool can be used quickly and repeatably. It is important to note that a decision on a preferred approach should not be taken without considering how a calculation tool might be used in respect of the certification processes, since there would be sense in using a common calculation method for all the Directive's requirements. This aspect is discussed in paragraph 44 et seq.

Preparing the building input data

- 16 A key methodological issue is preparing the input data for the calculation. For new build, this is relatively straightforward, since the details of the building geometry, fabric and HVAC plant etc will all be available from drawings and design specifications.
- 17 In refurbishment or extension work the issue is more problematic, since much of the data will not be directly available. Clearly those parts of the building that will be refurbished will be understood reasonably well, but the rest of the information will need to be developed in a cost effective way. BRE's NDEEM programme has been looking at the energy efficiency of the non-domestic building stock, and they have already developed some procedures for inferring performance data about existing buildings based on limited survey data. This is a key methodological area that needs to be developed further, and is a matter that will also be addressed within the proposed BEST-Cert project. BEST-Cert therefore provides the best avenue we are aware of for taking this aspect forward.

Preparing the activity data

- 18 A key input to the calculation is the way the building is used. At the design and construction stages of many buildings, the precise pattern of initial occupancy will not be known. For all buildings the pattern of occupancy in the medium to long term will not be known. Consequently, for Building Regulations compliance checking, a series of **Standard Activity Schedules** need to be defined. These will define the occupancy density, hours of use, associated lighting and small power loads etc. The development of these standard schedules is a key methodological issue that needs to be developed further, and will also be addressed by BEST-Cert.
- 19 These activity schedules would need to cover not just the common activities like general offices, class rooms, sports halls etc, but also specialist areas that might have high process loads such as dealer rooms etc. If there are significant amounts of such specialist activities in proposed buildings which could nevertheless be occupied more typically, it may be also be appropriate to check compliance against a more typical set of activity schedules to ensure the efficiency of the building is robust to a substantial turn down in energy demand.
- 20 These activities are summarised in the following diagram



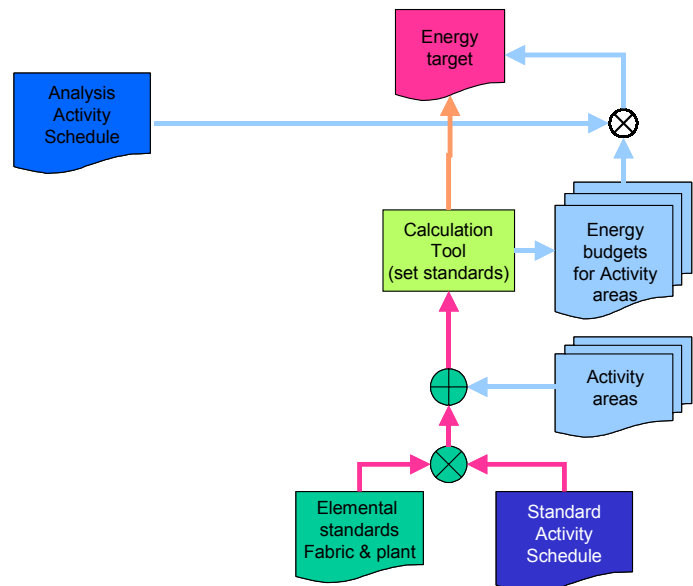
Setting the standards

- 21 A key issue for a whole building energy target approach to Part L is how to set the target. Clearly, different building types would have different energy targets. Two approaches to setting such targets are possible.
- 22 The first is to use historic measured data as the basis. This has the following difficulties –
 - a) Sufficiently good data sets do not exist for all building types
 - b) There will be a need to calibrate the model against the measured data set. This would be big task for all the building types that would be required.
- 23 The second approach is to generate a calculated value based on a generic standard building for each type. The problem with this is that there is no such thing as (e.g.) a “standard office”. The relative proportions of office operational area, service core, circulation space etc will depend on the shape of the building, which may well be dictated by site constraints.
- 24 This suggests that a building specific target needs to be generated, which can only be done through calculation. Two approaches are possible.

Option 1 - Activity Areas

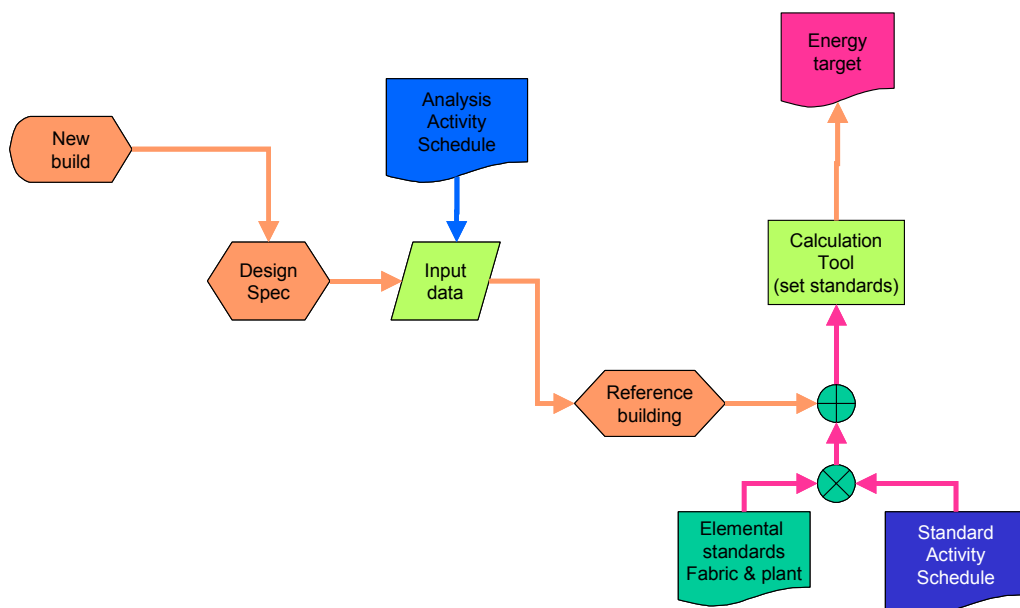
- 25 This approach would build on the standard activity schedules discussed above, but associate with each schedule a set of fabric and plant elements that could then be used to determine annual energy budgets for each type of activity area. The energy target for the building would then be the area-weighted sum of the energy budgets for all the various activity areas present in the building. This would require elemental standards to be defined for walls, windows, floors, plant efficiencies etc.
- 26 The difficulty with this approach is that the energy intensity of an activity area is dependent on its size and its location in the building. For example, a general office area would have a different energy demand depending on whether it was in the core of a deep-plan building, on a south-west perimeter or facing north.
- 27 Another problem is that activity area energy budgets would only be available for new build, and so for refurbishment or extensions, the whole-building energy target that would be generated would be unrealistically demanding

- 28 Energy budgets for activity areas has been used with success as part of Action Energy’s tailored benchmarking work, but there, the context is the position of a building in a continuous distribution, not relative to a single point pass/fail score.
- 29 This means that for the approach to be robust for application to compliance checking, there must be a degree of sophistication in generating the activity area energy budget. The following alternative approach eliminates this problem.
- 30 This approach is summarised in the diagram shown opposite.



Option 2 - Auto-generated target

- 31 As discussed under paragraph 23, the different size, shape and usage of a building means that it will be difficult to set a single performance standard for each generic type of building. This means that the target would have to be expressed as a function of the key variables, but generating a robust functional relationship for all building types would be a major task. If it is accepted that the key variables are size, shape, servicing strategy and usage, then the preparation of the data for the calculation of the building performance will have defined all these features in some detail. The size and shape will be defined by the building geometry, the servicing strategy by the HVAC specifications, and the usage via allocating Activity Schedules to the various zones of the building. This means that the standard calculation tool can provide the functional relationship that links size, shape and usage to an appropriate energy target. If a calculation was carried by substituting elemental fabric standards and elemental HVAC standards for those proposed in the actual design, then an appropriate target specifically configured for the particular shape and use of the building would be automatically generated.
- 32 This approach would also work for refurbishment or extension work. If the calculation only substituted the elemental standards for those parts of the building being refurbished or extended, the generated target would also automatically account for the performance of the retained fabric and plant. The approach is summarised in the following diagram.



Selecting the preferred option for generating targets

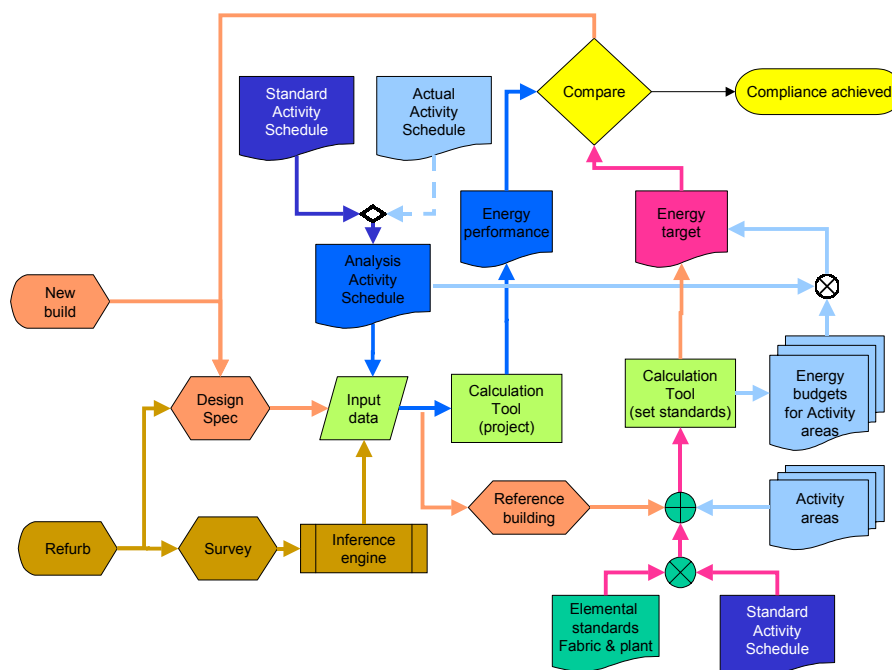
- 33 It should be noted that in both cases, the same basic input data is needed. In one case, the data is applied to notional areas, budgets are calculated and then added in proportion to the incidence of the area types in the building. Such an approach will rarely be accurate, since the general office activity area may be based on (say) a 100m² module with one exposed S facing wall. The energy budget for such an area would then be applied to all general office areas in the design. These may be ground floor, top floor, facing any number of orientations etc. It is easy to see that such an approach will not accurately generate a fair target for the building.
- 34 The auto-generation approach generates a target uniquely configured for the building. It avoids all the contentious issues associated with defining activity areas (although standard activity schedules will be required). All that will be required is to provide a module in the interface to the standard calculation tool that applies the elemental standards to the geometric data for the building (or that part of it that is being refurbished or extended).
- 35 This approach seems to offer many benefits, and so we are proposing to adopt this auto-generation approach.

Elemental standards

- 36 To proceed with the auto-generation approach, it will be necessary to define elemental standards in order to derive whole building targets. That does not mean designers will be constrained to adopt the elemental values. The only requirement will be to meet the whole building target (plus some “long stop” minimum standards such as those in the current ADL2), allowing full flexibility and scope for innovation.
- 37 However, the elemental standards will provide a number of other uses –
 - a) It will inform manufacturers and suppliers about the range of product standards they may need to deliver to market.
 - b) For those who want simplicity, they will know that if they meet all the elemental criteria (no trade-off allowed), their design is bound to be satisfactory without running any calculations.
 - c) The elemental standards may be especially helpful in small extension or refurbishment work, since it would eliminate the need for the survey activity needed to generate the whole building model (see paragraph 17)

The structure of the Part L compliance methodology

- 38 The overall framework for the compliance application as discussed above is shown diagrammatically below. It demonstrates how all the individual elements of the methodology integrate into an overall framework.



PRODUCING RATINGS FOR CERTIFICATES (ARTICLE 7)

- 39 The most fundamental methodological issue is what information should be displayed on energy performance certificates, and how that information should be interpreted. It has been agreed that two fundamental performance measures are needed, each of which would require their own benchmark(s) in order to indicate how the building compares with the rest of the stock.
- a) A measure of the intrinsic performance potential of the building. This will rate the standard of the building fabric and building services equipment. We have termed this the **Asset Rating**. This rating will be of particular interest to those purchasing or leasing a complete building, since the asset is the commodity they will be taking on. It is clear that the Asset Rating can only be based on a theoretical prediction.
 - b) A measure of in-use performance of the building. This will be influenced by the quality of the building (as measured by the Asset Rating), but also by the way the building is maintained and operated. This is of particular importance to energy managers who are trying to improve the efficiency with which the building is being used. It might also be of interest to someone considering taking a part of a larger building, where the management of the landlord services is not within their control. We have termed this parameter the **Operational Rating**, and it is clear that it must be based on actual metered energy consumption, normalised in some way to account for the effects of building size, pattern of use, weather etc.

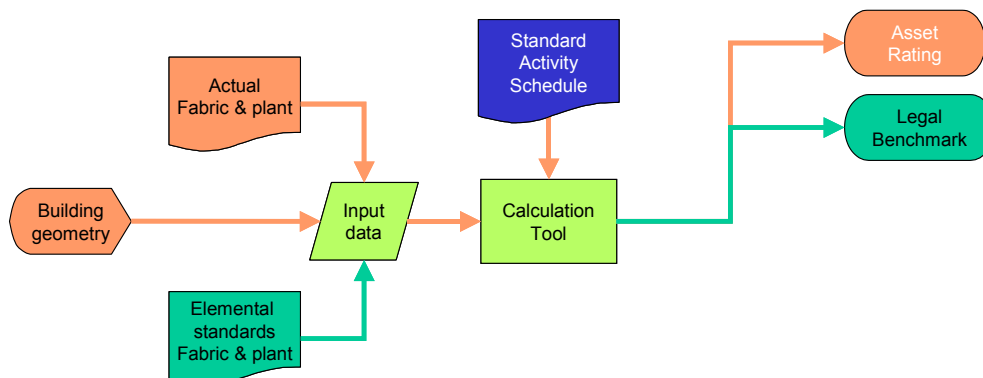
The Asset Rating

- 40 Since the Asset Rating is based on a theoretical calculation, it seems logical to base the calculation on the same tool as is used for Building Regulations compliance purposes. In this way, the Asset Rating becomes the result of the calculation of the performance of the new or refurbished building when demonstrating compliance. The Activity Schedule used to calculate the Asset Rating should always be the same to ensure like-for-like comparison. That means the building would have to be classified as one of a list of generic types.
- 41 Only when a certificate needs to be produced for an existing building that has not been subject to any refurbishment work would a new calculation be required. In such a situation, the data generation process would be as described in paragraph 17, except that all the data would be generated via the survey and the inference engine.
- 42 One weakness of this approach is that the Asset Rating will measure the standard of the building, assuming it has been constructed to appropriate quality standards, and that the systems have been installed and commissioned properly. One way to address this weakness would be to adjust the calculated rating based on the results of the airtightness and commissioning tests required by Part L. For each aspect of testing where the actual building was on the margins of acceptability, the calculated performance could be downrated. This would have two advantages. It would give a more realistic measure of the asset performance, but it would also provide a real incentive to achieve better standards of airtightness and commissioning. The only question is what should be done when the building has not been through a Part L check.
- 43 In such situations, it would be necessary to define a default adjustment factor (perhaps based on UK average values at the time of construction) that would apply unless the building owner could demonstrate that an alternative figure was justified, e.g. the plant had been re-commissioned. Work will be initiated to develop proposals for these adjustment factors.
- 44 In order to ensure like for like comparison between buildings, it is essential that the Asset Rating is based on calculations using the same tool. Under the discussion about Building Regulations compliance, two options were discussed, a simplified method and a detailed simulation method. Although the former had many advantages for compliance purposes, it had one major drawback, namely that it might not be able to address some of the technical issues that are features of some advanced or innovative designs. At first sight, this would suggest that the same problem would require that the simulation approach would have to be the single tool that was used to develop the Asset Rating, which might, in turn, influence the choice of tool for compliance checking (see paragraph 15).
- 45 In the discussion of the compliance checking, the principle of the comparative approach was accepted, which essentially states that

$$E_{actual,simplified} = E_{actual,simulation} * \left[\frac{E_{notional,simplified}}{E_{notional,simulation}} \right]$$

where E represents the predicted energy consumption, and the subscripts “actual” and “notional” refer to the actual design and the notional building respectively, and “simplified” and “simulation” refer to the type of model used to predict the energy consumption. Acceptance of the validity of this relationship means that any tool could be used to develop the Asset Rating, provided it was corrected to a scale based on the “simplified” calculation. This means that either type of calculation method could be appropriate as the standard tool, with the choice being made based on the best fit against the criteria listed in paragraph 8. The BEST-Cert project will investigate these different classes of tool and enable a final decision to be reached.

- 46 The benchmarks against which the Asset Rating would be compared could include
 - a) The rating of the building if it were constructed to the Part L elemental standards in force at the time the building was constructed,
 - b) The rating of the building if it were constructed to the Part L elemental standards currently in force.
 - c) By reference to the standards of the fabric and plant used in the actual building description, it might also be possible to define an “improved actual” building incorporating all cost effective improvements. A rating based on this data set would identify the maximum cost effective potential for the building.
- 47 We will look at the level of effort needed to generate these different benchmarks before making recommendations about which ones should be included on the certificate.
- 48 The methodology for the Asset Rating is summarised in the following diagram



The Operational Rating

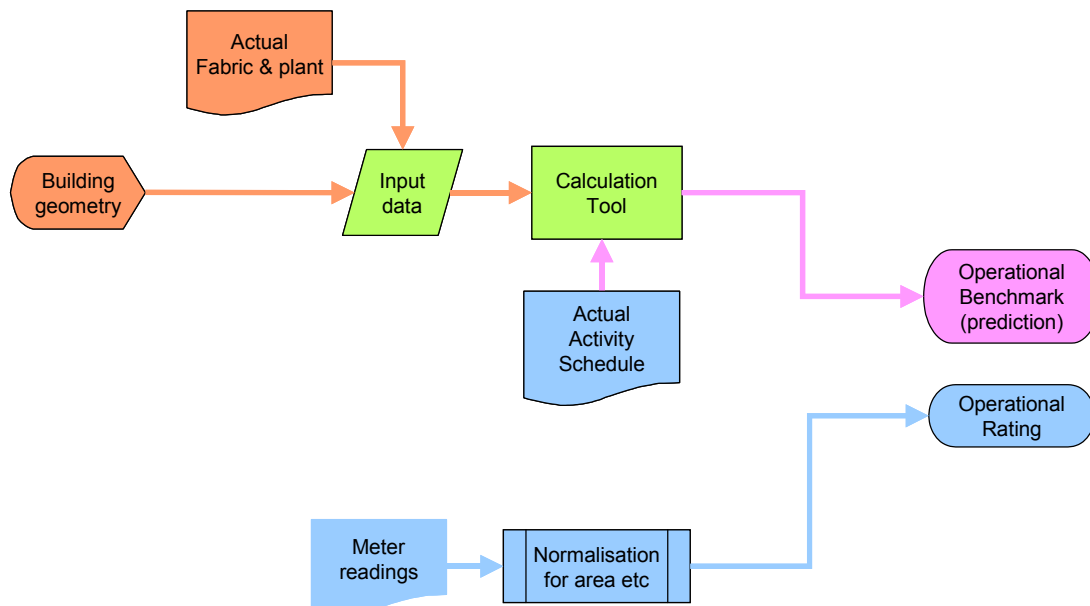
- 49 It is clear that the Operational Rating must be based on actual meter readings, and verified data used for normalisation (treated floor area etc.). The EuroProsper project is generating quality assurance procedures in respect of these requirements.
- 50 A key issue is to ensure that energy consumption is based on actual meter readings, not estimates. EuroProsper is developing procedures by which the quality of the data should be verified. It would be helpful if there were a requirement on utility companies to provide certified annual consumption data to facilitate the consistent provision of verified information. An approach will be made to OFGEM to see whether a requirement might be placed on the utilities to read meters at least annually, and to provide customers with certified annual consumption data.
- 51 The main methodological issue for the performance rating is the development of appropriate benchmarks. Two possible options have been identified, and are discussed in the following sections.

Option 1 - Calculated benchmarks

- 52 Under this option, we would use the standard calculation tool to predict the energy that would be consumed in the building when operated in the way the building is actually being used. This would

be done by running a calculation based on the Actual Activity Schedule rather than the Standard Activity Schedule.

- 53 The Actual Activity Schedule would also be the basis on which a series of calculations could be carried out to assess the energy saving potential of a number of possible building improvements. It is important that these be assessed on actual activities, since the way the building is used will have a big impact on cost effectiveness – e.g. a lighting replacement will be much more cost effective in an office with a continuous 24 hour day, 7 day week profile than one occupied 10 hours per day, 5 days per week. Similarly, the viability of some important strategies like CHP often require hours of use that are longer than might be indicated by a standard occupancy schedule.
- 54 Even in the best-managed building, the predicted performance will never compare with the actual ². In the ultimate sense, that does not matter, it is the ratio of measured rating to the benchmark that is important. It is the ratio that will give a measure of the management effectiveness. The difficulty is that until work is done on comparing actual performance with predictions of the standard tool, there is no way of knowing whether a ratio of (say) 1.8 is good, bad or indifferent.
- 55 Another issue is that by only producing ratings based on the Actual Activity Schedule, there is no way of comparing the operating performance of one building with that of another, since no two schedules will be alike. One way around this might be to produce not an energy rating per se, but an energy management effectiveness rating (the ratio discussed above). Coupled with the Asset Rating, these two numbers would give the two key numbers that describe the energy performance – how good is the building, and how good is the energy management regime.
- 56 This option for generating benchmarks is shown in the following diagram



² Predictions of energy consumption based on even the most sophisticated methodology will always differ from actual consumption. There are a variety of reasons for this.

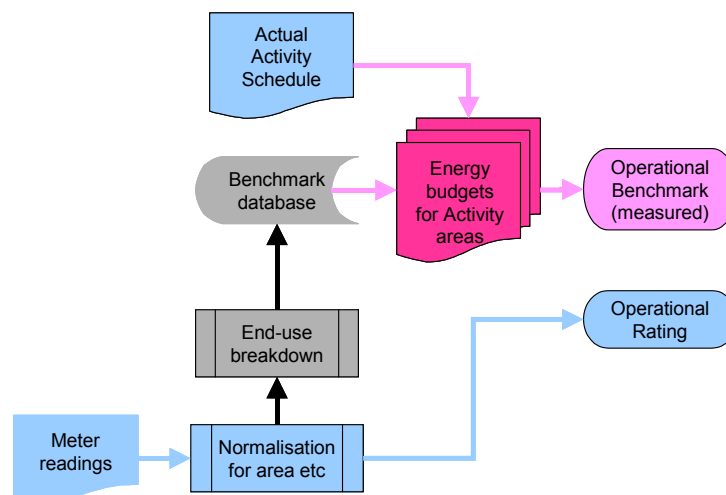
- a) The process of representing the building and its HVAC systems in the model will always involve simplifications.
- b) The building as constructed will not be a perfect realisation of the design intent (there may be areas of missing insulation, plant may not have been commissioned perfectly etc).
- c) The building may not be operated in an efficient way (lights might be left on when not required, set points might be higher than necessary etc).
- d) Even in the best-maintained and operated building, performance varies with time. For example, lighting systems are designed on the basis of a maintenance factor that recognises light output will degrade over time, and then improve again as luminaires are cleaned and/or lamps are replaced.

Cost effective improvements

- 57 The calculation tool could be used to evaluate the cost effectiveness of various upgrade options, either based on a generic list of measures that are known to be generally worthwhile, or on a list specifically proposed following a survey.
- 58 This calculation could be done
 - a) at a detailed level by re-running the calculation tool for each possible measure (or combination of measures), or
 - b) be based on assessments of savings based on the predicted end-use breakdown available from the benchmark calculation.
- 59 One limitation of this approach is that it assumes that if installed, the measure will deliver its potential. In reality, management shortcomings may negate a substantial element of the potential benefit. In practice, it would be appropriate to bring the building management (as indicated by the management effectiveness rating) up to an appropriate level before implementing any hardware improvements.

Option 2 - Measured benchmarks

- 60 The use of measured benchmarks has been the traditional approach, using data published in Action Energy’s Energy Consumption Guides. These benchmarks normalise the actual consumption to a standard pattern of use, and therefore enable the operating consumption of one building to be compared with others in its sector. The big advantage of this approach is that the benchmark becomes not a single value but a distribution, i.e. typical and good practice standards can be defined³.
- 61 One potential limitation of the method is that it is often difficult to place a building into a well-defined category. There are often mixed uses in a building (office with retail, retail with residential, factory with office etc), but even in a building that might be described as (e.g.) an office, there are many variants, such as relative proportions of cellular to open plan, the degree of provision of conference rooms, canteens etc. This has led to the development of “tailored benchmarks”, where benchmarks are associated with “Activity Areas” (e.g. cellular office, sports hall etc) rather than with overall buildings. This enables the building’s specific tailored benchmark to be derived from the area-weighted sum of the benchmarks for all the separate Activity Areas within it.
- 62 The use of Activity Areas will enable tailored benchmarks to be produced for all building types, provided reasonably credible data exists by which energy budgets can be established for all types of Activity Area. EuroProsper is developing benchmark data for a number of Activity Areas, and if this approach to benchmarking is adopted, this work will have to be extended to cover Activity Areas for all building types.
- 63 This optional approach to generating benchmarks is illustrated below.



64 One criticism of this approach is that it assumes there is no interaction between Activity Areas. This would be true if different Activity Areas were always served by independent systems, but this will often not be the case.

Cost effective improvements

65 The EuroProsper team have been developing a method for providing advice on improvements based on lists of generic measures for which typical cost effectiveness information is available.

66 Although their approach enables some broad recommendations to be made based on whole building energy consumption information, it works best where some reliable data is available on how the total consumption is broken down into its end-uses. The potential availability of such data should increase as the metering requirements of ADL(2002) becomes more common, but this still depends on the willingness of users to read their meters regularly.

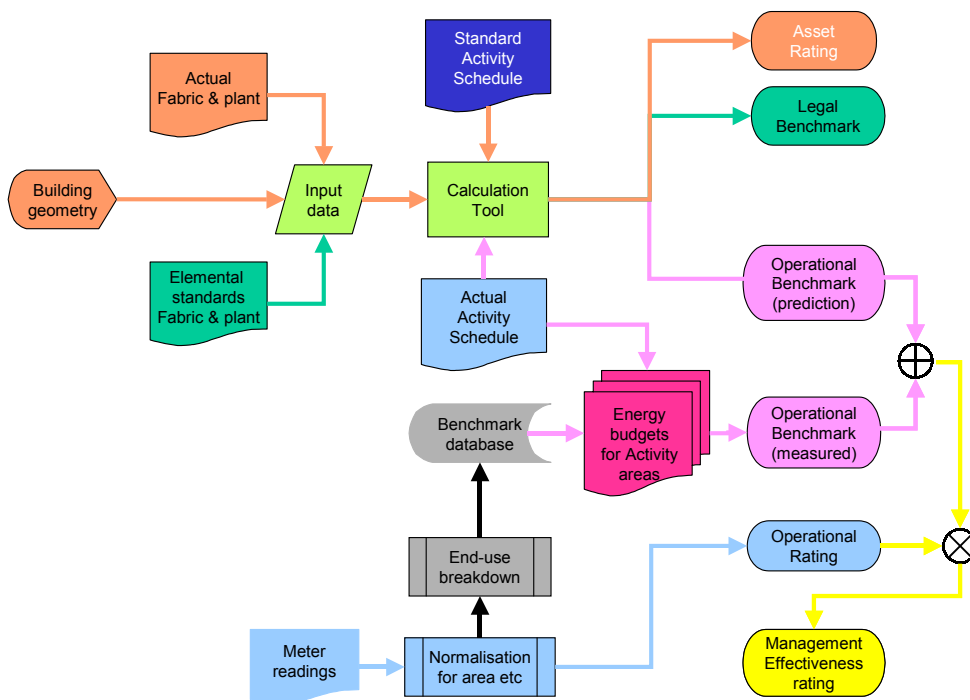
Choosing the best approach to generating benchmarks

67 In the final assessment, there seems little to choose between an approach that generates performance benchmarks from model predictions or measurements of end-use breakdowns. The final choice is likely to be based on which option is most cost-effective for industry to implement and apply. The model-based approach will require more centralised development effort, but could save time at the assessment stage. This will need further discussion, and we will engage in debate with the Carbon Trust and with the property sector to determine which will provide the most cost-effective approach.

68 Whatever approach is finally adopted, there would be tremendous benefit in collecting data based on asset descriptions, Asset Ratings and Operational Ratings. Over time, this would develop into an invaluable database that could provide important insights into design and operational strategies that generate energy efficiency improvements. It would provide a vital tool to bridge the design / operating performance gap by providing the feedback loop that is so lacking at present. We will explore with the Carbon Trust and with industry to see if and how such an initiative might best be taken forward.

The structure of the Article 7 methodology

69 The certification process as discussed above is shown diagrammatically below, and demonstrates how all the individual elements of the methodology integrate into an overall framework.



³ In time, a distribution curve for energy management effectiveness ratings (see paragraphs 54 - 55) could also be developed, which would deliver the same benefit.

SUMMARY OF METHODOLOGY TASKS

- 70 Following on from the above discussion, there are a number of development tasks that need to be carried out. The main ones are –
- a) To decide on the preferred basis for the calculation tool needed for Part L compliance checking and for providing the basis of the Asset Rating element of the certificate. *The BEST-Cert project will compare the relative merits of simplified and detailed simulation models, and develop recommendations in this area (see paragraph 15).*
 - b) To develop an agreed set of Activity Schedules. *This task is an element of the BEST-Cert project (see paragraph 18).*
 - c) To develop an agreed set of elemental standards for different types of construction and for different building services systems. *Delivering proposals in this respect is one of the principal tasks for the Part L review, with public consultation planned for the Summer of 2004.*
 - d) To develop a system whereby technical performance data for construction and building services systems can be inferred from limited survey data. Some work in this area has been done under BRE's NDEEM project for the Global Atmosphere Division of DEFRA. *It also forms an important element in BRE's proposed European BEST-Cert project (see paragraph 17).*
 - e) To develop procedures for producing the Operational Rating. *This is being addressed by the EuroProsper project (see paragraph 50). We will approach OFGEM to see if a requirement might be placed on utility companies to make regular certified meter readings available to customers occupying buildings of over 1000m².*
 - f) To decide how best to produce benchmarks against which the Operational Rating might be compared, along with an associated list of possible cost effective improvements. EuroProsper are developing a method based on measured data for different types of ActivityArea, which is principally aimed at offices but could be extended into other sectors. A method based on calculation could be developed as an adjunct to the tasks required for activity a) above. *A final decision will be made following discussion with industry on the most cost effective approach (see paragraph 67).*

ANNEX A - ORGANISATIONS INVOLVED IN DEVELOPING THE PROPOSED METHODOLOGY

ODPM

DEFRA

Scottish Executive

FaberMaunsell

Representatives of BRAC

BRE

Energy for Sustainable Development

William Bordass Associates